

What is Claimed is:

[c1] A method for preparing high scrap recycle content flexible polyolefin compositions comprising:

creating a melt blend comprised of up to 50% by weight thermoplastic scrap material, up to 15% by weight poly(ethylene-co-vinyl acetate) and the remainder of the melt blend comprised of a blending composition;

wherein the melt blend is formed by feeding said components to a melt compounding extruder operating at sufficient temperature, residence time and screw configuration to produce a homogenous melt blend;

solidifying said melt blend;

wherein the blending composition is comprised of from 40% to 60% by weight polypropylene, at least 40% by weight impact modifier and up to 15% by weight plasticizer;

wherein the polypropylene is an isotactic polypropylene polymer with 6 to 7 percent by weight attached ethylene chains;

wherein the impact modifier is either olefin copolymer or terpolymer of ethylene, propylene and a non-conjugated diene;

wherein the plasticizer is selected from the group of compositions consisting of diundecyl phthalate, tri-2-ethyl trimellitate, mineral oil, butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate;

wherein the thermoplastic scrap material comprises granulated blends further comprised of between 12 and 35% by weight polyamide;

up to 3% by weight polyester;

up to 5% by weight polypropylene;

up to 15% by weight poly(ethylene-co-vinyl acetate); and

up to 75% by weight poly(ethylene-co-vinyl acetate) filled with inorganic compositions wherein said inorganic compositions are further comprised of BaSO₄ and CaCO₃ and;

wherein the flexible polyolefin composition so produced comprises at least 16 percent by weight of the polypropylene.

- [c2] The method of claim [c1] wherein the impact modifier comprises olefin polymer.
- [c3] The method of claim [c1] wherein the plasticizer is selected from the group of plasticizers butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate.
- [c4] The method of claim [c1] comprised from 40% to 50% by weight thermoplastic scrap, from 8% to 12% by weight poly(ethylene-co-vinyl acetate) and from 38% to 52% by weight blending composition.
- [c5] The method of claim [c1] wherein the flexible polyolefin composition is suitable for use in motor vehicle interiors.
- [c6] The method of claim [c1] wherein the flexible polyolefin composition is suitable for use in automotive products requiring a Class A finish.
- [c7] The method of claim [c1] wherein the flexible polyolefin composition has a flexural modulus from 15,000 to 38,000 psi.
- [c8] The method of claim [c1] wherein the compounding melt extruder is a co-rotating twin screw extruder containing transport zones, at least one kneading zone, and at least three mixing zones.
- [c9] The method of claim [c8] wherein the plasticizer is added to the

composition to an extruder transport zone situated subsequent to at least one mixing and kneading zones but prior to at least one mixing zone.

[c10] A method for preparing high scrap recycle content flexible polyolefin compositions comprising:

creating a melt blend comprised of up to 50% by weight thermoplastic scrap material, up to 15% by weight poly(ethylene-co-vinyl acetate) and the remainder of the melt blend comprised of a blending composition;

wherein the melt blend is formed by feeding said components to a melt compounding extruder operating at sufficient temperature, residence time and screw configuration to produce a homogenous melt blend;

solidifying said melt blend;

wherein the blending composition is comprised of from 40% to 60% by weight polypropylene, at least 40% by weight impact modifier and up to 15% by weight plasticizer;

wherein the polypropylene is a random polypropylene polymer with 2 to 3 percent by weight attached ethylene chains;

wherein the impact modifier is either olefin copolymer or terpolymer of ethylene, propylene and a non-conjugated diene;

wherein the plasticizer is selected from the group of compositions consisting of diundecyl phthalate, tri-2-ethyl trimellitate, mineral oil, butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate;

wherein the thermoplastic scrap material comprises granulated blends further comprised of between 12 and 35% by weight polyamide;

up to 3% by weight polyester;

up to 5% by weight polypropylene;

up to 15% by weight poly(ethylene-co-vinyl acetate); and

up to 75% by weight poly(ethylene-co-vinyl acetate) filled with inorganic compositions wherein said inorganic compositions are further comprised of BaSO₄ and CaCO₃ and;

wherein the flexible polyolefin composition so produced comprises at least 16 percent by weight of the polypropylene.

- [c11] The method of claim [c10] wherein the impact modifier comprises olefin polymer.
- [c12] The method of claim [c10] wherein the plasticizer is selected from the group of plasticizers butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate.
- [c13] The method of claim [c10] comprised from 40% to 50% by weight thermoplastic scrap, from 8% to 12% by weight poly(ethylene-co-vinyl acetate) and from 38% to 52% by weight blending composition.
- [c14] The method of claim [c10] wherein the flexible polyolefin composition is suitable for use in motor vehicle interiors.
- [c15] The method of claim [c10] wherein the flexible polyolefin composition is suitable for use in automotive products requiring a Class A finish.
- [c16] The method of claim [c10] wherein the flexible polyolefin composition has a flexural modulus from 15,000 to 38,000 psi.
- [c17] The method of claim [c10] wherein the compounding melt extruder is a co-rotating twin screw extruder containing transport zones, at least one kneading zone, and at least three mixing zones.
- [c18] The method of claim [c17] wherein the plasticizer is added to the

composition to an extruder transport zone situated subsequent to at least one mixing and kneading zones but prior to at least one mixing zone.

[c19] A method for preparing flexible polyolefin compositions comprising:

creating a melt blend comprised of a blending composition;

wherein the melt blend is formed by feeding said components to a melt compounding extruder operating at sufficient temperature, residence time and screw configuration to produce a homogenous melt blend;

solidifying said melt blend;

wherein the blending composition is comprised of from 40% to 60% by weight polypropylene, at least 40% by weight impact modifier and up to 15% by weight plasticizer;

wherein the polypropylene is either a random polypropylene polymer with from 2% to 3% by weight attached ethylene chains or an isotactic polypropylene with from 6% to 7% by weight attached ethylene chains;

wherein the impact modifier is either olefin copolymer or terpolymer of ethylene, propylene and a non-conjugated diene;

wherein the plasticizer is selected from the group of compositions consisting of diundecyl phthalate, tri-2-ethyl trimellitate, mineral oil, butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate.

[c20] The method of claim [c19] wherein the impact modifier comprises olefin polymer.

[c21] The method of claim [c19] wherein the plasticizer is selected from the group of plasticizers butylbenzene sulfonamide, epoxidized soybean oil, octyl tallate, butyl tallate, octyl tallate and alkyl tallate.

- [c22] The method of claim [c19] wherein the flexible polyolefin composition is suitable for use in motor vehicle interiors.
- [c23] The method of claim [c19] wherein the flexible polyolefin composition is suitable for use in automotive products requiring a Class A finish.
- [c24] The method of claim [c19] wherein the flexible polyolefin composition has a flexural modulus from 15,000 to 38,000 psi.
- [c25] The method of claim [c19] wherein the compounding melt extruder is a co-rotating twin screw extruder containing transport zones, at least one kneading zone, and at least three mixing zones.
- [c26] The method of claim [c25] wherein the plasticizer is added to the composition to an extruder transport zone situated subsequent to at least one mixing and kneading zones but prior to at least one mixing zone.